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CHRYSANTHEMUM LEUCANTHEMUM AND THE AMERICAN WHITE WEED.

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No plant in the eastern United States and Canada, it is safe to say, is more familiarly known than the White Weed, Marguerite, or Ox-eye Daisy, the *Chrysanthemum Leucanthemum* of our floras. So abundant is the plant in all settled regions that, like many others of our commonest plants, it is very generally ignored by the botanical collector. From late May to August the plant whitens with its showy heads millions of acres of field and meadow, and in the trail of the explorer it is among the first field-plants to make its appearance. Its closest botanical affinity is with a large group of Old World species, and it was apparently not noted in New England as a wild plant by Josselyn in the 17th century, though in 1785 Manasseh Cutler recorded it from about Boston "in fields and pastures . . . very injurious to grass land."¹ These facts together with the tendency of the plant during more than a century to follow closely the path of the white man in America have led to the natural conclusion that our White Daisy was brought to us within historic time from Europe; and, as it strongly resembles the Old World *Chrysanthemum Leucanthemum*, the American plant has been universally accepted as identical with that European species.

The common American plant scarcely needs special description, yet it is important to note that, as it occurs in the fields and clearings of New England and as represented in the Gray Herbarium from many stations ranging from Nova Scotia to the Rocky Mountains, the Gulf of Mexico and southern California, the long-petioled obovate

¹ Mem. Am. Acad. i. 483.

basal leaves are coarsely and unequally toothed or even cleft, the slightly broadened bases usually fimbriate; the lower cauline leaves are oblanceolate, shorter-petioled, with irregular coarse teeth and lacerate broadened bases; the middle and upper cauline are narrowly oblong or narrowly oblanceolate, with irregular teeth, and with deeply lacerate broadened bases, and the very uppermost are linear or almost filiform and greatly reduced in length. With slight variation in the degree of tothing, practically all the American material exhibits these general tendencies of the foliage, though, as would be expected, the plants vary extremely in size and development according to the nature of the soil in which they have grown.

In July, 1902, however, while visiting the shores of the Baie des Chaleurs in the County of Bonaventure, Quebec, Mr. Emile F. Williams and the writer noticed that the Daisy of that district had leaves of quite different outline from those with which we were familiar in New England. The long-petioled spatulate-obovate basal leaves were closely and almost regularly crenate, the petioles with slightly broadened rarely fimbriate bases; the lower cauline shorter-petioled broadly spatulate leaves had regularly crenate or dentate blades, entire broad petiolar portions and somewhat coarsely toothed bases, the middle and upper cauline were oblong or broadly oblanceolate, with coarse subascending teeth much shorter than in the New England plant.

A study of this chrysanthemum from the Bonaventure region shows it to be quite identical with the European material in the Gray Herbarium passed by Nees von Esenbeck, Schultz Bipontinus, Klatt, and other eminent European students of the Compositae as typical *Chrysanthemum Leucanthemum*, L. (*Leucanthemum vulgare*, Lam., *Tanacetum Leucanthemum*, Schz. Bip.). The specimens further match such representative plates of the European *Chrysanthemum Leucanthemum* as those of Reichenbach (Icones Florae Germanicae, xvi. t. 97, fig. 1) and Thomé (Flora von Deutschland, iv. t. 584). This broad-leaved plant, the common *Chrysanthemum Leucanthemum* of Europe, is apparently little known in America. Besides the plant collected in Bonaventure, Quebec, the only American material seen by the writer is an uncharacteristic sheet from St. John's, Newfoundland, and two individuals which have recently appeared in a lawn on the estate of Oakes Ames, at North Easton, Massachusetts.

In attempting to identify the plant which abounds in fields so gen-

erally through the eastern United States and southern Canada much difficulty has been encountered. Careful search through European literature has shown that *Chrysanthemum Leucanthemum* is there regarded as a species very variable in its foliage, but in only one flora has the form so generally established in America been clearly defined. Lamarck & De Candolle in their *Flore Française* divided *C. Leucanthemum* into six varieties; and of these var. “ γ , *foliis semipinnatifidis*” with the further note that “la variété γ a les feuilles toutes découpées et presque pinnatifides,”¹ seems to be the plant so generally established in America. In the Gray Herbarium two French specimens, one cultivated in 1832 in the Luxembourg Garden, the other from the fields of Arenthon, Haute-Savoie, labeled “V. à feuilles pinnatifides,” are quite like the common American plant; but these, as indicated by their labels, were collected in France as noteworthy variations. An old English specimen, collected in 1838 by John Ball in Westmoreland, departs considerably from the typical form of *C. Leucanthemum* as recognized by Nees, Schultz, Klatt, Blytt, and others, as does the plate in Sowerby's *English Botany* (ix. t. 601) showing that in England as well as France an extreme form very like the American tendency of the plant occurs.

In order further to verify the conclusions to which the study of these plants was leading, the writer sent specimens from Vermont of the characteristic American form and from New Carlisle, Quebec, of the Baie des Chaleurs plant, to Dr. Max Gürke, Custodian of the Royal Botanical Museum at Berlin, whose continuation of Richter's *Plantae Europaeae* is setting so high a standard of scholarship in the preparation of botanical check-lists. In response to the letter accompanying these specimens, Dr. Gürke says under date of May 25, 1903:

“*Chrysanthemum Leucanthemum* ist in Mitteleuropa ausserordentlich variabel in Bezug auf die Blattform, und viele Autoren erwähnen dies auch in ihren Beschreibungen. So sagt, um nur ein Beispiel anzuführen, *Döll* in seiner *Flora von Baden* p. 920: ‘Untere Blätter gestielt, verkehrt-eiförmig, kerbig-gezähnt; die stengelständigen sitzend, halb-stengelumfassend, länglich-lineal, gesägt. Variirt mit eingeschnittenen, selbst fast fiederspaltigen Blättern, mit fast ebensträussigem Blütenstand und mit einem durch stärkere Behaarung graulich-weissem Stengel.’

“Soweit ich aus der Litteratur ersehen habe, führt aber kein Autor Varietäten in Bezug auf die Blattform mit *besonderem Namen* an, und

¹ Lam. & DC. *Fl. Fr.* iv. 178 (1805).

ich habe mich auch an dem im Berliner Herbarium aufbewahrten Material überzeugt, dass es schwer sein würde, aus der langen Reihe von Blattformen, deren Endglieder die von Ihnen gesandten zwei Exemplare darstellen, bestimmte Typen herauszugreifen.

“Es scheint, als ob in der Verbreitung der Formen ein Unterschied zwischen Amerika und Europa vorhanden ist. In Mitteleuropa ist entschieden die Form mit spatelförmigen oder länglich-lanzettlichen, gesägten Blättern, also die Form, welche Sie mir von Quebec gesandt haben, entschieden bei weitem *häufiger*, und kann bei uns wohl als Typus der Art betrachtet werden, während die Form mit schmälern, eingeschnittenen oder fiederspaltigen Blättern, d. h. also die Form, welche gleich ist der Greenman'schen Pflanze von Vermont, *seltener* ist. Eine gesonderte geographische Verbreitung dieser beiden extremen Formen habe ich aus dem mir vorliegenden Material nicht ersehen können.”

Thus, from these observations of Dr. Gürke it appears, as had already seemed probable from the material in the Gray Herbarium, that the extreme form of *Chrysanthemum Leucanthemum* found on the Baie des Chaleurs is the abundant form in central Europe and may be considered the type of the species; while the form ordinarily abundant in America is rare in Europe, where, however, it does not



Fig. 1.

differ in geographic range from the typical plant, and though noted by various authors has received no distinctive name. In America, on the other hand, the variety with narrower more deeply and sharply toothed leaves is so widely distributed and has so uniformly held its distinctive features that it seems worthy special recognition. The two extremes of the plant, whose essential differences of foliage are well brought out in the accompanying drawings prepared by Mr. F.

Schuyler Mathews, are quickly distinguished as follows.

CHRYSANTHEMUM LEUCANTHEMUM, L. (Fig. 1.) Basal leaves spatulate-obovate, on slender elongate petioles, the blades crenate-dentate, the slightly broadened petiole-bases rarely fimbriate; lower cauline leaves on shorter broader petioles, with slightly pinnatifid or lacinate bases; middle and upper leaves oblong or broadly oblanceolate, coarsely and regularly short-crenate or -dentate above, with somewhat larger teeth at base.—Common in Europe. In America, established in fields, Bonaventure Co., QUEBEC, and at St. John's, NEWFOUNDLAND (*Robinson & Schrenk*); locally as a lawn-weed, North Easton, MASSACHUSETTS, and to be expected elsewhere.

Var. **subpinnatifidum**. (Fig. 2.) Basal leaves coarsely and irregularly toothed or lobed, often with the petioles fimbriate at base; lower cauline oblanceolate or narrowly spatulate, subpinnatifid, often even along the petioles, with sharp or bluntish simple or serrate irregular teeth, and with lacerate bases; middle and upper cauline narrowly oblong or narrowly oblanceolate, similarly subpinnatifid.—*C. Leucanthemum*, γ . *Foliis semipinnatifidis*, Lam. & DC. Fl. Fr. iv. 178 (1805).—Abundant in fields and meadows in eastern United States and Canada, and locally westward to the Pacific, apparently introduced from Europe, where it is rare. Represented by very many specimens, among them the following numbered ones from America: NOVA SCOTIA, Yarmouth, June, 1901 (*Howe & Lang*, no. 94); NEW HAMPSHIRE, Jaffrey, July 4, 1897 (*Robinson*, no. 123); VERMONT, Manchester, June 24, 1898 (*M. A. Day*, no. 97); MASSACHUSETTS, Nantucket, May 29, 1900 (*M. A. Day*, no. 112); CONNECTICUT, Southington, June 10, 1898 (*L. Andrews*, no. 23); UTAH, Wahsatch Mts., Aug. 14, 1879 (*Jones*, no. 1266); CALIFORNIA, Sta. Cruz, 1860–62 (*Brewer*, no. 814); and from FRANCE, Jardin du Luxembourg, June, 1832 (*Herb. J. Gay*); Arenthon, Haute-Savoie, May, 1862 (*Herb. Joad*).



Fig. 2.